

What is claimed is:

- 1 1. An electrochemical deposition system comprising:
2 a housing;
3 a plating system disposed within the housing;
4 a remediation module disposed within the housing; and
5 a substrate transfer system disposed within the housing and adapted to transfer a
6 substrate directly from the remediation module to the plating system.
- 1 2. The system of claim 1, wherein the plating system comprises a plating chamber
2 disposed within the housing, having a plating bath within.
- 1 3. The system of claim 1, wherein the plating system comprises a plating bath disposed
2 within the housing.
- 1 4. The system of claim 1, wherein the substrate transfer system comprises a robotic
2 handling system.
- 1 5. The system of claim 1, wherein the substrate transfer system comprises a single
2 device instance.
- 1 6. The system of claim 1, wherein the substrate transfer system comprises multiple
2 device instances.

1 7. The system of claim 1, wherein the remediation module comprises a dedicated
2 treatment system.

1 8. The system of claim 7, wherein the treatment system comprises a reactive plasma
2 system.

1 9. The system of claim 8, wherein the reactive plasma system comprises hydrogen
2 plasma.

1 10. The system of claim 8, wherein the reactive plasma system comprises oxygen plasma.

1 11. The system of claim 7, wherein the treatment system comprises a non-plasma reactive
2 environment system.

1 12. The system of claim 11, wherein the non-plasma reactive environment system
2 comprises an ultraviolet ozone remediation system.

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1 13. A device for performing electrochemical deposition of copper on a substrate having a
2 copper seed layer, the device comprising:

3 a housing;

4 a copper plating bath disposed within the housing;

5 a seed layer treatment system, disposed within the housing, comprising a reactive
6 environment medium; and

7 a substrate transfer system disposed within the housing and adapted to transfer the

8 substrate directly and immediately from the reactive environment medium to the copper
9 plating bath.

1 14. The device of claim 13, wherein the reactive environment system comprises a
2 reactive plasma system.

1 15. The device of claim 14, wherein the reactive plasma system comprises hydrogen
2 plasma.

1 16. The device of claim 14, wherein the reactive plasma system comprises oxygen
2 plasma.

1 17. The device of claim 13, wherein the reactive environment system comprises a non-
2 plasma reactive environment system.

1 18. A method of depositing copper upon a semiconductor substrate, comprising the steps
2 of:
3 providing a substrate having a copper seed layer formed thereon;
4 exposing the substrate to a reactive environment treatment adapted to remove
5 contaminants from an exposed surface of the copper seed layer;
6 immediately transferring the substrate from the reactive environment treatment to a
7 copper plating bath; and
8 plating copper onto the copper seed layer utilizing the copper plating bath;
9 wherein the steps of exposing the substrate to a reactive environment treatment,
10 immediately transferring the substrate, and plating copper onto the copper seed layer are

11 performed within a single apparatus.

1 19. The method of claim 18, wherein the reactive environment treatment comprises a
2 reactive plasma system.

1 20. The method of claim 18, wherein the reactive environment treatment comprises a
2 non-plasma reactive environment system.

1 21. A method of removing surface contaminants from a copper seed layer disposed upon
2 a semiconductor substrate in preparation for electrochemical deposition, comprising the steps
3 of:

4 providing an electrochemical deposition apparatus having a contaminant remediation
5 module housed within;

6 transferring the semiconductor substrate into the remediation module;

7 using the remediation module to remove contaminants from the surface of the copper
8 seed layer; and

9 immediately transferring the semiconductor substrate from the remediation module
10 into a plating system also housed within the electrochemical deposition apparatus.